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**EG&G ROCKY FLATS**

DIST.	ATTN	CHK
BENJAMIN, A.		
BERMAN, H.S.		
BRETZKE, J.C.		
BURLINGAME, A.H.		
COPP, R.D.		
CROUCHER, D.W.		
DAVIS, J.G.		
EVERED, J.E.	X	
FERRERA, D.W.		
FRANCIS, G.E.		
GOODWIN, R.		
HANNA, B.J.		
JARMAN, I. K.		
JEALY, T.J.		
JECKER, E.H.		
JENS, J.P.		
KERSH, J.M.	X	
KIRBY, W.A.		
KUESTER, A.W.		
KRIEG, D.		
LEE, F.M.	X	
MAJESTIC, J.R.		
MARX, G.E.		
MEURRENS, B.E.		
MORGAN, R.V.	X	
POTTER, G.L.	X	
PIZZITO, V.M.		
SAEFFEL, R.F.		
SANDLIN, N.R.		
SHEPHERD, I.R.		
SWANSON, E.R.		
WIER, J.S.		
MILKINSON, R.B.	X	
WILSON, J.M.		
YOUNG, E.R.		
ZANE, J.O.		
Jilhoff, F.H.	X	
Jennedy, C.E.	X	
Jhoades, J.L.	X	
Jemison, E.A.	X	
Jones, L.E.	X	
Judson, C.M.	X	
Jones, P.S.	X	
Jones, R.D.	X	
Jones, R.T.	X	
Jones, M.Z.	X	
Jones, M.	X	
Jones, B.K.	X	
Jones, D.M.	X	
Jones, Track	X	
Jones, CONTROL	X	X
Jones, TRAFFIC		

EG&amp;G ROCKY FLATS, INC.

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February 19, 1992

92-RF-1655

Robert M. Nelson, Jr.

Manager

DOE, RFO

Attn: D. P. Simonson

**REQUEST FOR EG&G TO PROPOSE A PROGRAM TO CHARACTERIZE RFP - JMK-0131-92**

Ref: D. P. Simonson ltr (11059) to J. M. Kersh, Request for EG&G to Propose a Program to Characterize RFP, December 26, 1992

Attached is a draft proposal for a program to characterize RFP (and surrounding area) surface soils that we believe will achieve the goals outlined in the above referenced letter. EG&G believes that this is a technically sound request and will support DOE in their efforts to budget, schedule and implement it.

Some relevant information is being collected as part of the Baseline Risk Assessment on Operable Unit No. 1 (OU 1) under the soil actinide movement study on OU 2 and the vegetation distribution data under Environmental Evaluation studies on OUs 1, 2, and 5. This information, while useful, is not sufficiently extensive and does not describe soil series and does not combine the required measurements for all required background evaluations proposed here.

The attached proposal is intended to provide a basis for discussion during meetings and a basis for preparing detailed plans and schedules. We suggest that the first meeting be held after DOE has reviewed the accompanying proposal.

If you have any questions regarding this proposed program, please contact J. E. Evered, Director of Environmental Management at extension 4934 or L.E. Woods of the Remediation Programs Division at extension 5417.

*J. M. Kersh*  
J. M. Kersh, Associate General Manager  
Environmental and Waste Management

LEW:dml

Orig. and 1 cc - R. M. Nelson, Jr.

Attachment:

As Stated

CC:

S. R. Grace - DOE, RFO

B. R. Lewis - "

F. R. Lockhart - "

P. Powell - "

R. J. Schassburger - "

B. K. Thatcher - "

## CLASSIFICATION:

UCI		
UNCLASSIFIED	X	X
CONFIDENTIAL		
SECRET		

## AUTHORIZED CLASSIFIER

SIGNATURE  
*J. E. Evered*  
DATE *2/10/92*

IN REPLY TO LTR NO.

0083-RF-9242

PC:

LTR APPROVALS:

MA: *JE*SB: *(for RFO)*

ORIG &amp; TYPIST INITIALS

LEW/dml

RF-46469 (Rev. 10/91)

REVIEWED FOR CLASSIFICATION/UCI	
BY	G. T. OSYEN <i>bw</i>
DATE	8-25-93

A-DU02-000999

DRAFT PROPOSAL  
FOR  
RFP SURFACE SOIL CHARACTERIZATION

## Technical Understanding

A program to characterize the surface soils at the Rocky Flats Plant (RFP) is important for several reasons. Background concentrations of metals, radionuclides and organic compounds need to be known so that reasonable contrasts can be made with potentially contaminated sites. In assessing both the nature and extent of contamination and the risks to human health and the environment as required in (CERCLA-RCRA)-IAG investigations, the concentrations of substances already present in the surface soils must be known. The differences in concentrations between soil series and the variability inherent within and between soil series are important factors in determining if differences between potentially contaminated areas and uncontaminated areas really reflect contamination or simply reflect natural variability. Second, for the selection of reference areas, prudence suggests, and NRDA regulations require, that the same soil series be present as in potentially contaminated areas, at least for measurements of surface soils and plant tissues. Failure to consider the soil series and its natural concentrations of chemical could result in artificially low concentrations of some analytes in reference areas. This would indicate the need for expensive and time-consuming cleanup where there is no contamination. Third, the soil series are important in themselves for considerations like the Farmland Protection Policy Act (USDA-Soil Conservation Service lead), and for providing information for land management decisions, as well as for guiding the interpretations listed above.

To our knowledge, no systematic study of surface soils at the Rocky Flats Plant has been conducted relative to the above requirements. A Background Geochemical Characterization Report provided useful summaries of substance concentrations in geologic strata. This information provides reference concentrations for borehole and well samples, but does not directly address concentrations at the surface or in the upper soil layers that must be considered in Risk Assessment or for compliance with biologic statutes. A substantial amount of data was collected for the OU 2 Phase I RCRA Facilities Investigation/Remedial Investigation (RFI/RI) and other data may exist in files such as the USGS open files, or in reports like the USDA Technical Bulletin series. Radioisotopes have been characterized to some extent in areas that are known or suspected to be contaminated. A thorough literature search to collect, compile and translate available data that may exist into a usable form would be an important part of a background soil characterization program.

## Requirements

### Literature Review

A thorough literature search to seek an understanding of RFP and Front Range soil distributions and background chemical concentrations is indicated. As mentioned previously, the available data have not, to our knowledge, been thoroughly surveyed to provide the kinds of information required by the programs mentioned above. If surface soils information exists, searching for it, obtaining it, and assessing it for our purposes would be a large undertaking and should be part of this project. We are not optimistic that a substantial amount of useful information will be available, but we will not know until the search has been conducted.

Soil Sampling Plan - In addition to a literature and data review, a field sampling effort is indicated. The final decision on how a sampling effort should be accomplished must include detailed evaluations of the data requirement and the data quality requirements. Listed here are three approaches to surface soil sampling and their relative merits. These three are not mutually exclusive. We would like to discuss the limitations and the possible combinations of these approaches when we meet.

Options	Merits
Order 1 Soil Survey	Locates individual soil series. Provides a basis to locate reference areas. Assists in interpretations of apparent biotic anomalies. Provides a basis for locating sample sites for physical, chemical or biological parameters.
Stratified Random Samples	Can be implemented quickly. Requires limited data on which to stratify. Simplified statistics. Provides for testing differences between study and background sites.
Geostatistical Distribution	Describes the distribution of analytes. Prevents excessive reliance on single data points. Provides a high level of confidence in the distribution of chemicals.

#### Analytical Plan (initial thoughts)

Options	Quality Levels
Radionuclides	V
Organic Compounds	IV
Metals	IV
Order 1 Soil Survey Field data	I
Order 1 Soil Survey Lab data	III
In-Situ Gamma-Ray Spectroscopy	I

#### Planning and execution

Detailed planning for the literature search, field sampling plan and analytical plan must be completed in conformance with EPA's Data Quality Objective process. This process will address the required levels of information including the need to understand the nature and distribution of surface soils, radionuclides, metals and organic compounds in the RFP environs, and the need to establish realistic cleanup levels.

A sampling program might include an Order 1 Soil Survey of the RFP buffer zone, with samples collected for chemical and or radiological analysis from appropriate numbers and locations of the sites sampled for the soil survey. An Order 1 Soil Survey generally calls for shallow cores or tile spade samples on 200-foot centers. This will be sufficient information for soil classification and will allow associations of more than one soil to be separated and boundaries to be much more clearly located than they currently are in the Golden Area Soil Survey. Analysis of each of these samples could be cost-prohibitive and time consuming for any objective listed above. For the various purposes listed, sample sizes, sample numbers and locations might be selected based on the data quality objectives and the needs of each purpose. Even if the samples are not taken simultaneously with the soil survey samples, the soil survey will help guide the collection of those samples. Some offsite samples might be required to provide appropriate reference areas or to

provide increased assurance to the public that analytes are not derived from RFP. As a first approximation, a one-mile radius around the buffer zone would provide information useful for resource management decisions and would assist in the location of suitable sampling sites for risk assessment and other calculations. The extent, type of sample, location and numbers should be decided after a thorough review of the data quality requirements and the requirements for appropriate statistical analysis.

Analytic requirements are different for each purpose. Samples can be analyzed for selected radionuclides, contaminants of concern, or for selected organic compounds. The required QA levels will also vary with the type of analysis. Radionuclides generally require level V, Risk Assessment requires at least level IV, as does the existing Background Geochemical Characterization Report, while soil classification data will usually be level II for field data and level III for corresponding laboratory analysis. These levels should also be selected during the preliminary planning stage of this project. Another level of analytic effort is presented by analysis with in-situ gamma-ray spectroscopy. This instrumentation can assess the buffer zone at the same locations as the soil survey samples and provide a description of the radionuclides at each site. Much larger areas than the buffer zone plus one mile will be required to establish background levels for this type of survey. This program could, however, provide a substantial amount of pertinent information. For example, we may be able to use isotopic ratios to distinguish radionuclide contributions originating from RFP from those of fallout or natural origin.

## **Impacts**

It is our estimate, on the basis of the requirements listed above, that this program may take 1.5 to 2.5 years to complete. If executed to the levels suggested above, the program could cost two to five million dollars. It is too late to include this information in the RFI/RI work for OUs 1 and 2, but useful information could be provided in time for assessment work at other operable units. In the longer term, this information will strengthen feasibility studies at all of the operable units, and will support the verification phase after the remedial actions and corrective measures are implemented. It will also provide important information needed to comply with NRDA trustee concerns. There is currently no funding provided for this type of surface soil characterization program.